DOCUMENT RESUME

ED 404 211 SO 024 406

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TITLE Educational Quality and Effective Schooling. International Commission on Education for the Twenty-First (Vancouver, British Columbia, Canada, April 11-12, 1994).
INSTITUTION International Commission on Education for the Twenty-First Century (UNESCO), Paris (France).
REPORT NO EDC-94/CONF-003/; EDC/IV/2
PUB DATE Apr 94
NOTE 14p.; For related papers, see SO 024 394-407 and SO 024 448-454.
PUB TYPE Speeches/Conference Papers (150) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Class Size; Curriculum Development; Developing Nations; *Educational Quality; Educational Research; Effective Schools Research; Elementary Secondary Education; Foreign Countries; Global Approach; Instructional Materials; Language of Instruction; *School Effectiveness; Teacher Effectiveness

ABSTRACT

This paper discusses the importance of expansion of the quantity of schooling and enhancement of the quality of schooling, both of which can be seen as directed towards the same goal, the improvement of educational outcomes for the population. Because both quantitative and qualitative investment projects in the education sector compete for the same limited public investment funds, from a public policy point of view, there is likely to be a trade off between quantitative expansion and qualitative improvement. In order to provide information on which sound policy-making can be based, it is important to identify the educational and economic returns to investment in both quantity and quality, and to understand the interactions between them. In this way overall strategies can be formulated and assessed that will provide an appropriate balance between these two avenues for achieving national objectives for educational development. This paper discusses the link between quality and performance by exploring what research shows. A disparity exists among countries at different stages of development because when existing quality levels are low, as in most developing countries, the impact of quality improvements on student achievement at the margin are far more marked than when quality levels are already quite high. Factors affecting quality are: (1) teacher quality; (2) class size; (3) instructional materials; (4) language of instruction; and (5) curriculum reform. Characteristics of effective schools are listed, and conclusions and policy implications are discussed. Contains 42 references divided into 9 sections.

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EDC/IV/2
APRIL 1994

ED 404 211

Commission internationale sur l'éducation pour le vingt et unième siècle

International Commission on Education for the Twenty-first Century

EDUCATIONAL QUALITY AND EFFECTIVE SCHOOLING

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EDC-94/CONF.003/
29 March 1994

International Commission on Education for the Twenty-first Century

Vancouver, Canada
11-12 April 1994

EDUCATIONAL QUALITY AND EFFECTIVE SCHOOLING

Ken Gannicott and David Throsby[1]

1. Introduction

During the 1960s, the recognition that public expenditure on education was not a form of social welfare or consumption expenditure but a hard-headed investment crucial to economic growth caused something of a revolution amongst educational planners and policymakers. The desirability of such investment was interpreted in these early days in both developed and developing countries as indicating the need for expansion of educational facilities to allow for increases in enrolments. The OECD countries were experiencing rapid economic growth at that time, and investment in educational expansion held out the prospects of continued economic benefits. In the developing world, the countries of Africa and Asia gave high priority to the expansion of schooling as they moved out of colonial rule and away from reliance on expatriate skills.

During the 1970s and 1980s, however, many governments became aware that the rapid expansion of enrolments during the 1960s and early 1970s may have been achieved at the expense of lowered educational standards. At the same time, tightened budgetary constraints forced governments in many countries (both developed and developing) to reassess spending priorities; it became apparent that continuing uncontrolled quantitative expansion of enrolments might not be the most effective means of achieving desired educational goals in times of increasing fiscal restraint. As a result, researchers and policymakers shifted away from an emphasis on quantitative issues and began to pay attention to educational quality and its effect on learning outcomes. The concept of educational quality in this context refers to such features as the training and standards of teachers, the supply and quality of teaching materials such as textbooks, the standards of school buildings and facilities, the health, nutritional status and prior learning of students themselves, and the nature and efficiency of educational administration and infrastructure.

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[1]Paper prepared for the International Commission on Education for the Twenty-first Century, Paris, March 1994. The authors are, respectively, Professor of Education at the University of Wollongong, New South Wales, and Professor of Economics at Macquarie University, Sydney, Australia.

Expansion of the quantity of schooling and enhancement of quality can be seen as directed ultimately towards a similar goal, the improvement of educational outcomes for the relevant age-groups in the population. Yet both quantitative and qualitative investment projects in the education sector compete for the same limited public investment funds. It follows that, from a public policy point of view, there is likely to be a trade-off between quantitative expansion and qualitative improvement. In order to provide information on which sound policy-making can be based, it will be important to identify the educational and economic returns to investment in both quantity and quality, and to understand the interactions between them. In this way overall strategies can be formulated and assessed which will provide an appropriate balance between these two avenues for achieving national objectives for educational development.

2. The Link Between Quality and Performance: What Does the Research Show?

There is now a wide range of evidence on the effects on educational outcomes of investment in improving school quality. Much of this work has originated in the United States where the basic link between quality and performance has been clearly established. But it has also turned out that the results of this research are relevant to developing countries as well. A series of studies carried out during the 1980s in a number of low and middle-income countries, including Egypt, Brazil, Chile and Mexico, have found that attention to school quality yields substantial payoff in terms of children's cognitive skills, their school achievement levels and their ultimate success in the labour market. Furthermore, it has been found that by and large these effects are more pronounced in developing than in developed countries. The results of one cross-country comparison are typical: Heyneman and Loxley[2] in 1983 measured the effects of primary school quality on academic achievement in twenty-nine countries and found that the proportion of explained test-score variation attributable to school quality was lowest in countries such as Sweden, Japan, Australia and the US, but was two to three times higher in countries such as Botswana, India, Thailand, Bolivia, Colombia and El Salvador.

The reasons for the disparity between countries at different stages of development are clear: when existing quality levels are low, as they are in most developing countries, the impact of quality improvements on student achievement at the margin are far more marked than when quality levels are already quite high. This developed/developing country disparity has an economic as well as an educational dimension. Studies that have measured the social rate of return to investment in various educational strategies over the last twenty years have shown not just that society's marginal rate of return to investment in school quality is at least as large as its return on additional years of schooling, but also that there are diminishing returns to expenditure per student. In other words, the expenditure on quality yields high results when expenditure per student is low, but diminishes quite sharply as expenditures are increased. The implication is that the benefit from increased expenditure on educational quality in developing countries is likely to be quite substantial, given their generally low current levels of expenditure per student; on the other hand, in developed countries, simply spending more money on school quality may not necessarily lead to improvements in school quality that will be worth the costs. In these latter countries, an alternative approach to the problems of school quality will be necessary.

3. What Factors Affect Quality?

So far we have referred to "educational quality" as if it were a single homogeneous entity. In fact, it comprises a complex bundle of factors whose individual importance may vary

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[1]Full references to literature cited are contained in an Appendix to this paper.

substantially from place to place and from time to time. Let us examine the principal factors affecting school quality, drawing distinctions as necessary between the situations in low- and high-income countries. We consider five major dimensions of quality: the level of training of teachers; class size; instructional materials; the language of instruction; and curriculum reform. Since there is so much variation in the importance of each of these aspects in different cases, the order of their priority will vary widely between countries, and the order in which we treat them here is of no significance.

(a) ***Teacher Quality***

There is a stark contrast between the levels of teacher quality in the developing and developed world. It follows that policies to deal with problems of teacher quality are likely to differ between poor and rich countries.

In most developing countries, primary level teachers are in principle required to have some elementary teacher training plus at least junior secondary education behind them, with correspondingly higher requirements for teachers at secondary level. In practice, however, shortages of trained teachers are so widespread that underqualified persons are frequently employed as teachers, especially at the primary level where specialized knowledge is less needed, and in remote locations where teachers with qualifications are particularly scarce. In some extreme cases when budget limitations are acute, underqualified teachers may be actually preferred, since the costs of employing them will be lower in conditions where teachers' pay scales are geared to formal qualification levels.

While there is overwhelming evidence that the quality of teachers is important, however, it must not be supposed that there is therefore a strong case for long periods of pre-service teacher training. No consistent relationship has been found to exist between levels of pre-service pedagogical training of primary-level teachers and actual teaching practices in schools. In many developing countries an emphasis on in-service training has been found to be preferable to the more expensive traditional pre-service modes of teacher training. Such in-service education may take many forms, including short-term residency programs, continuous within-school programs, and distance education by correspondence and/or radio. It has the advantage that it can be tailored to suit the local conditions in which the teachers are working.

In developed countries, on the other hand, the standards of qualifications amongst teachers are generally high. In all OECD countries the educational qualifications of teachers have risen strongly in recent years. In part this simply reflects the general expansion in tertiary enrolments since the 1960s, but it is also a function of specific policies to upgrade the educational background of teachers. Teachers' colleges offering two- or three-year diplomas are giving way in many countries to programs built around a three- or four-year bachelor's degree together with a specialist qualification in teacher training, and often with a postgraduate qualification. In the United States, for example, barely one-quarter of public school teachers had a masters degree in 1966; twenty years later, well over half held a masters degree.

There is no evidence that this improvement in the qualifications of teachers has led to any increase in the effectiveness of teaching and learning. Reviewing over one hundred studies which had measured the effect of teacher education, Hanushek found in his 1986 study that barely ten percent of studies had revealed a statistically significant relationship, and these were evenly split between positive and negative effects on learning outcomes.

Similarly, there is no strong evidence that the length of teacher experience is important. While finding some positive relationship, Hanushek described as "hardly overwhelming" the evidence in favour of the argument that teacher experience is a powerful factor in teaching. This judgement has been corroborated by more recent studies such as that by Chubb and Moe in

1990, who found that the experience of a school's teaching staff is unrelated to the achievement of its students; in their sample of schools they found that the average proportion of teachers with substantial experience on the staff was much the same for academically unsuccessful as for successful schools.

Thus, in most industrialized countries, spending more money on teacher training on its own is unlikely to be of benefit in improving educational outcomes for students.

(b) ***Class size***

One of the longest-running debates in education concerns the role of class size. It is a matter of considerable policy importance because, given the high proportion of educational recurrent costs absorbed by teachers' salaries, even a small change in teacher/pupil ratios has a large impact on funding requirements. Campaigns to reduce class size have figured prominently in the activities of teachers' unions, and there has been considerable popular support for smaller classes, no doubt on the assumption that better educational outcomes would result. The research literature is immense, and despite inevitable differences between individual studies, the overall conclusion is that for a wide range of class size smaller classes make virtually no difference to learning outcomes in either developing or developed countries.

Lafleur *et al.* tabulated 130 different studies in 1974 across a range of countries, and concluded that there is no learning advantage in small classes, although teacher satisfaction was greater in smaller classes. Glass *et al.* summarized the results of seventy-seven studies up to 1982 and found that within the range of twenty to forty students per class only slight gains in learning were made as class size fell. Only if class size fell below fifteen students were there considerable gains in learning. In 1986 Hanushek reviewed 112 studies of class size, and found that only twenty-three had produced statistically significant results. More strikingly, of these twenty-three, the majority (14) displayed a statistically significant negative relationship; that is, in these cases learning outcomes were actually better in larger classes.

It must be stressed that these conclusions relate to class sizes within the range commonly experienced in most countries. It is certainly true that in very small classes (10-15 students) learning can be significantly enhanced, through attention to the needs of students individually, just as in very large classes (say 70+) discipline and monitoring of progress breaks down to the detriment of the learning process. Nevertheless, it is apparent that, despite frequent assertions to the contrary, class size will not matter much for pupil achievement, provided the size of class falls within the range of about 25-50 students.

Furthermore, reductions in class size are costly. To illustrate, in a school of 600 pupils and an average class size of 30, reducing class size to 25 would be expected to add about 20 per cent to recurrent costs, and would probably require additional capital expenditure as well. It is quite clear that, if the aim is to improve school quality, these resources could be better deployed in avenues other than reduction in class size.

(c) ***Instructional Materials***

Teaching materials include textbooks, student guides, maps, blackboards, chalk and other teaching equipment, pens, pencils, paper and so on. Of these the most important is the textbook. The evidence on the importance of textbooks and other instructional materials for the learning of students is overwhelming. Yet, despite their manifest importance, instructional materials are often the most neglected input into the educational process, especially at the primary level. This is a particular problem in developing countries where in many cases students either lack textbooks altogether or are required to share textbooks with other students.

Furthermore, the quality of those books which are available is frequently poor, in respect of both their physical and their instructional characteristics.

The importance of teaching materials indicates that the return at the margin to increased supply and improved quality of materials, especially textbooks, is likely to be high, particularly when levels of current provision are low. Yet in the recurrent educational budgets of many developing countries, where these conditions typically obtain, little is left for the purchase of instructional materials, even in "good times", once the salary bill for teachers is met. The problem is exacerbated in "hard times", since, when public budgets are squeezed, instructional materials and basic teaching supplies are often the first and easiest items to cut. Accordingly, the provision of instructional materials has been an important focus of efforts to raise school quality in the developing world. Attention has been paid mostly to textbooks, their purchase, local production and/or distribution. At the primary level these efforts have been aimed at reducing the student:textbook ratio from levels of around 10-20 or more to one to a level of around 2:1.

In recent times the nature of the educational process has begun to be radically changed through the introduction of computers. Traditional modes of both teaching and learning are being transformed. Instructional materials such as blackboards, chalk, study guides etc. are being replaced with computer-based methods of teaching. Textbooks are giving way to interactive multi-media packages on CD-ROM. Many of these developments are still in their infancy. So far they have been tried out mainly in school environments in advanced countries, but computers have already begun to have an impact in some developing countries as well.

Such advances in educational technology cannot be seen simply as the introduction of new hardware into schools; rather, their successful application requires extensive software development, re-training of teachers, and a fundamental re-orientation in the way educational services are provided. If properly handled, their adoption is likely to have a major positive impact on the quality of education in schools throughout the world, though a full analysis of their benefits and costs in economic terms remains to be undertaken.

(d) ***Language of Instruction***

In many countries the language used for instruction in schools is no mere technical issue to be decided on purely pedagogical criteria, but is a matter of high political and social importance. In several parts of Europe and North America, there is debate about the appropriate language or languages as the primary means of instruction in schools. In some countries issues are raised concerning the rights of ethnic minorities to instruction in a language other than the national one of the country in which they reside. Many developing countries with a colonial past have seen their national language as a tool for building national unity amongst a linguistically diverse population. Some such countries, in Africa, Asia, and the South Pacific, have reacted to this problem by adopting the language of the ex-colonial government as at least one of the national languages, and using it as the official medium of instruction in schools, sometimes from the earliest grades of primary school. While the wider arguments are understood, the problem from the purely educational point of view is that the national language in such situations may be spoken as the mother tongue by no more than a small proportion of the population.

Research carried out during the 1960s and 1970s provided no single answer to the question of the best language to choose for primary instruction. More recently, the view appears to have hardened that instruction in the national language in primary school, when that language differs from the mother tongue, is detrimental to student performance. It is argued that in such circumstances much primary schooling is taken up teaching the language in which lessons will be given, before the lessons themselves can be taught at a satisfactory standard. Current research suggests that (i) good speaking and writing skills in a second language are better

achieved when there is a strong foundation in the first language; (ii) conversational skill in a second language comes earlier than ability to use that language for academic learning; and (iii) academic knowledge learned in the local vernacular or dialect is readily transferable, and does not have to be relearned in the national language.

(e) *Curriculum Reform*

The curriculum is a vital element in determining the quality of education received by school children. In some countries efforts have been made to standardize and coordinate school curricula in order to deliver a more recognizable and assured quality of education across a wide diversity of schools. In developing countries, the debate about the curriculum has been centred on the relative need for "vocational" and "academic" education, especially once basic skills of literacy and numeracy have been acquired. Curriculum reform has involved the introduction of technical and vocational elements into secondary school curricula, in the hope of improving the employability of school leavers and making education more relevant to local needs. However, efforts to diversify school curricula in this way have by and large proved unsuccessful.

The debate about curriculum reform is extensive, but there are two main reasons for the failure of curriculum reform in developing countries to have the hoped-for results. Firstly, schools have only a limited ability to shape pupils' attitudes to the jobs they want to do. What really matters is the structure of incentives in the wider economic system; occupational aspirations are determined by the individual's perception of opportunities as well as his or her innate preferences. Secondly, it has come to be realized that the formal school system is an inhospitable venue for occupational training. School-based vocational training is neither as effective nor as cheap as that carried out on the job or in specialized training centres. Schools are institutions for imparting general skills such as reading, writing, mathematics, and scientific understanding, for teaching widely applicable skills such as bookkeeping and typing, and for inculcating general occupational skills such as attitudes to work, punctuality and discipline. It has been recognized for some time that specific vocational skills are better developed in an environment more closely related to the eventual workplace.

4. Effective Schools

The issue of "school effectiveness" has stirred considerable controversy amongst educational researchers, planners and policymakers in recent years. It has been argued that emphasis on educational inputs such as class size or teachers' salaries overlooks the more intangible aspects of school quality that are of vital importance, such as school ethos, the commitment of teachers, or the support of parents. The "effective schools literature", as it has come to be called, has used small-scale case-studies of individual schools or classrooms to tap these intangible aspects of student achievement. A very large literature, drawn from investigations in both United States and European schools, has produced findings inevitably diverse in detail but consistent enough to compile a clear picture of the characteristics of an effective school, summarized as follows: An <u>effective school</u> is characterized by:

- A safe and orderly climate, with discipline based on clear rules enforced fairly and consistently.

- Emphasis on student acquisition of central learning skills, with curriculum organization used to achieve agreement on goals.

- Frequent evaluation and monitoring of students' performance.

- Strong leadership, both instructional and administrative, by the principal and senior staff.
- A strong sense of community, with teacher commitment to the school and active teacher involvement in decision making.
- Clear goals and high expectations of student achievement, with schoolwide recognition of academic success.
- Effective use of time, with few disruptions or time devoted to nonacademic activities.
- Parents informed about, and supportive of, school goals and student responsibilities, especially with regard to homework.

Whilst this research has been influential, it has also come under strong methodological criticism, especially because the question has been approached almost exclusively not from the consumers' perspective but in terms of what the producers regard as effectiveness. Nevertheless, it has come to be accepted that the effective schools literature has provided a genuine contribution to the debate about school quality, and recent work bringing both quantitative and qualitative variables into the ambit of rigorous statistical testing has confirmed the vital importance for school effectiveness of qualitative measures such as those listed above.

The dimensions of school effectiveness noted above are clearly related to issues of management and administration in education systems and in schools themselves. The quality of educational management and administration may seem to be so far removed from day-to-day classroom teaching that it would have little effect on educational quality. There is reason to believe, however, that good educational management is vital to maintaining educational quality. This is because good management underpins all the issues which have been discussed in the previous section. Educational administration in this context refers to three broad levels: at the *centre*, we refer to the central functions of planning, development of sectoral strategy, provision of inputs, monitoring and evaluation through national testing programs, and so on; at the *intermediate* or *local* level (e.g. state, province or district), the administrative structure provides support and assistance to schools through, for example, the channelling of inputs, the monitoring of school performance and the provision of a focus for community support; and at the *individual school* level, the role of management is in day-to-day operation, organization and provision of incentives to staff.

In most countries, educational administration is highly centralized and in some it is becoming more so. Research in a number of countries has suggested that considerable gains in school effectiveness can be achieved through decentralization of at least some aspects of educational management. This research points to the desirability of providing for increased school autonomy and decentralized decision-making. Generally speaking, schools are in a much better position to respond to local community needs and conditions than a centralized management. Because education is based strongly on relationships between teachers and students, most of the necessary resources exist at the level of the school itself, and upper levels of the organizational hierarchy have little to contribute that is not already there. Furthermore, the intangible or qualitative characteristics of effective schools may be extremely difficult to measure in a complex central bureaucracy but quite amenable to workable specification at school level (for example, every principal can identify disciplinary effectiveness or teacher professionalism, even if these cannot be precisely measured).

5. Conclusions and Policy Implications

Strategies for educational development, both short-term and long-term in both developing and developed countries, cannot afford to ignore educational quality. Programs for educational expansion that concentrate only on numbers of students without regard to the standard of education being delivered may end up being self-defeating. So much can be said as a generalization. To become more specific in terms of desirable policy directions will lead to different conclusions for different countries at different stages of development.

In developing countries it is important to look at the whole range of factors affecting school quality in order to identify which ones are acting as crucial constraints to development. But, having drawn attention to the specific dimensions of the quality issue, it is important to point out that they are not independent of each other. Raising the quality of science teachers, for example, may have little effect if the teachers do not have adequate laboratories and equipment to work with. New textbooks cannot be effectively utilized if they are inconsistent with the curriculum in use. If educational management is weak, the process of establishing an effective curriculum and selecting textbooks will be inadequate. Problems of language teaching exacerbate problems of low quality teachers and insufficient books. In the production of desired educational outcomes, the various aspects of quality interact in a variety of ways, some obvious, some more subtle.

The implication of this for policy is clear. Strategies to improve educational quality will fail or at least be less than fully effective if they overlook important complementarities between components of quality. In terms of investment priorities in the education sectors of developing countries, this is likely to mean that quality improvements have to be delivered as a package, rather than as one-off projects concentrating on a single aspect of the problem to the neglect of others.

At the other extreme, in developed countries, where levels of educational quality are generally already high, it is essential to understand that the major determinants of educational expenditures - class size, teacher education and teacher experience - do not show a reliable relationship with measured learning outcomes. Hence it is likely that increased expenditures will also be unrelated to such outcomes. Thus simply spending more money is unlikely on its own to lead to improved educational achievement.

The OECD (1985:72) implicitly endorsed the wider application of this result in observing that "politicians and educational administrators have become wary of throwing more money at schools", and more recently noted the increasing recognition that "beyond a certain ceiling, additional resources appear to make little or no impact on educational outcomes" (OECD 1989:4). In recent research noteworthy for its careful sampling and statistical work, Chubb and Moe (1990) concluded that "money is not what makes some schools more effective than others. Better schools do not require lots of expensive equipment or huge new buildings or vast libraries. The performance problems of schools have little or nothing to do with inadequate funding, and they cannot be corrected by digging deeper into the public purse".

Nevertheless, current research has been less than successful in providing guidance on how schools in developed countries can improve their educational quality. It is one thing to identify those characteristics which distinguish effective from ineffective schools; it is quite another to know how to use public policy to enhance those characteristics. This is a particularly crucial deficiency because a major lesson to be learned from the effective schools literature is that, as noted earlier, improved quality must be seen as a package. There is no single key to higher student achievement.

Thus, ways of achieving an overall organizational "ethos" or "climate" constitute much of the contemporary research agenda in school quality in the developed world. Much of this work is focussed on exploring the appropriate managerial and administrative structures at all levels to bring about more effective schools. Some of this work has argued that improved school quality will only be achieved by moving to a strongly market-based system in which for-profit schools are encouraged to supplant the public system. Other writers suggest that effective schools can be achieved through substantial deregulation and much wider consumer choice, perhaps using a modified voucher scheme. A somewhat less radical line of attack (and one which is being implemented in many countries) is to experiment with schemes of school-based management within a wider public education system. Whatever the precise policy recommendation, the common theme in all these policy prescriptions is an emphasis on the creation of administrative structures for educational systems that will provide a supportive overall framework within which schools can operate with increased autonomy and closer interaction with the various communities they serve.

APPENDIX

A Selective Guide to Research on Educational Quality

1. *Educational Quality in Developed Countries*

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